Between Culture and Biology

Perspectives on Ontogenetic Development

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1 Culture, biology and development across history

Gustav Jahoda

The natural sciences as we know them began some three centuries ago, and their accelerating progress has revolutionized our outlook on the physical world. If one of these predecessors of the time were to be transported into the twenty-first century he would probably be incapable of comprehending the kinds of scientific questions that are being asked today. By contrast, questions about the nature of human nature were being asked from long before the scientific revolution of the seventeenth century, and some of the basic problems of today would not be totally unfamiliar to our distant ancestors. They are, of course, being phrased differently now: the three key terms in the present title were either invented fairly recently ('biology' in 1802), or only began roughly to approximate their current meaning during the latter part of the nineteenth century. It does not follow, however, that before the emergence of this vocabulary there was no awareness of the issues to which it refers.

The aim here is to sketch a range of different approaches dominant in particular periods and to document the recurrence of certain major themes. Given the limitations of space, the coverage will necessarily be highly selective and generally simplified. The selection was governed by a focus on topics mentioned in the title, but it no doubt also reflects my personal bias. The presentation will follow a roughly chronological order, tracing the manner in which key concepts emerged and how their meanings and postulated relationships changed.

One constant thread, concerning the dichotomy of nature versus nurture, has ancient roots in the West; and as usual one can go back to Aristotle. For him all things were potentially what they had the capacity to become; but the external environment might prevent full realization of such potential. For example, an acorn might fail to become an oak because it had fallen on stony ground. As regards humans, the relative weight assigned to nature versus nurture has varied, with the pendulum swinging from one side to the other in different historical eras. It is only very recently that the misleading character of such a dichotomous formulation has come to be recognized.

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Early background

Differences between human groups have puzzled people since time immemorial, and remarkably similar arguments attributing differences to external influences persisted over more than a millennium. As early as the seventh century Isidorus of Seville (d. 636) commented that, in accordance with diversity of climate, the appearance of men and their colour and bodily size vary, and diversities of mind are also found. The effects of climate, notably of the sun turning the skin black, were debated until the nineteenth century. For most of that period there was of course no strictly 'biological' alternative, since Christian doctrine held that all humans descended from Adam and Eve; only a few unorthodox thinkers such as La Peyère dared to propose multiple creations. None the less, critiques of the climatic hypothesis were voiced, and a typical counter-argument of the kind common in the debate was put forward by Leonardo da Vinci (1452–1519). He denied that the black races of Ethiopia are the product of the sun; 'for if black gets black with child in Scythia [a northern region], the offspring is black; but if a black gets a white woman with child the offspring is grey' (Slotkin, 1965, p. 39).

As well as climate, 'custom' was often used in post-Renaissance Europe to account for human differences; and I have argued in some detail elsewhere (Jahoda, 1993) that its meaning tended to be close to what we know as 'culture'. This comes out clearly in a passage from Descartes (1596–1650), who also was one of the first to put forward a biological approach to psychology:

> I . . . recognised in the course of my travels that all those whose sentiments are very contrary to ours are yet not necessarily barbarians or savages, but may be possessed of reason in as great or even greater degree than ourselves. I also considered how very different the self-same man . . . may become according as he is brought up from childhood amongst the French or Germans, or has passed his whole life amongst Chinese or cannibals . . . I thus concluded that it is much more custom and example that persuade us than any certain knowledge. ([1637] n.d., p. 60)

Later John Locke said much the same thing. The arguments were sometimes highly sophisticated. Thus Blaise Pascal (1632–62) wrote: 'Custom is a second nature . . . But what is nature? For is custom not natural? I am much afraid that nature is itself only a first custom, as custom is a second nature' (Slotkin, 1965, p. 120). This may be compared with Boesch (1991, p. 21): '"Nature" is no antipode to "culture"; nature, as we experience it, is already culture.'

Among these early writings I have not come across anything about child development as we would understand it, but the prolonged helplessness of the offspring of humans as compared with those of animals was repeatedly noted. Also, the child was often seen as a *tabula rasa*. As Pierre Charron (1541–1603), a follower of Montaigne, put it: 'While . . . the Soul is fresh and clear, a fair and

perfect blank . . . there can be no difficulty in making it what you please; for this Condition disposes it to receive any manner of impression, and to be moulded into any manner of form' (cf. Slotkin, 1965, p. 115). As shown later in more detail that was essentially what Margaret Mead believed at one stage in her career.

Imitation, later elevated by Gabriel Tarde into a cardinal principle, was said to characterize the child. For instance Bernard Mandeville (1670–1733) suggested that the child adopts customs through its 'fondness of imitation', by aping others. He also anticipated Piaget on animism: 'All young children seem to imagine, that everything feels and thinks in the same Manner as they do themselves: And . . . they generally have this wrong opinion of Things inanimate . . . ' (Slotkin, 1965, p. 267). While such parallels are intriguing, they refer only to scattered observations rather than any systematic approach.

Generally, children were seen as lacking in 'sense' or reason, a deficiency also usually attributed to 'savages'. Hence these were sometimes compared to children, a practice that became extremely widespread during the nineteenth century. But between the seventeenth and nineteenth centuries a radical though only temporary change occurred, at least among a group of leading intellectual figures.

The Enlightenment

The change was made possible by the fading of theological authority, while that of science was rising. A spirit of inquiry prevailed, and the success of the physical sciences led to the belief that similar methods might be applied to the study of human nature regarded as part of, and not, as previously, apart from, nature at large. There would seem to be certain intriguing parallels between Enlightenment ideas and those prevalent during the major part of the twentieth century. I refer here to underlying values and kinds of questions asked, rather than to results obtained, of which there were few.

Eighteenth-century biology was essentially taxonomic, culminating in the classical systematization by Linnaeus. Yet as regards the species *Homo*, he was far from certain where its boundaries should be drawn. There was also a wider discussion about humans' puzzling similarity to apes; but exotic others were not initially seen as specially ape-like, as they were later. Humanity was usually perceived as unitary and, in the words of William Robertson ([1777] 1808, p. 221): 'A human being, as he comes originally from the hand of nature, is everywhere the same.' Differences between human groups were interpreted as a function of stages of progress among societies, perceived as analogous to child development. The stages were seen as related to modes of subsistence, and these in turn were linked to what we would call 'ecologies'. The stages envisaged, which have remained more or less constant to our day, were as follows: hunting, fishing and collecting; pastoralism; agriculture; and, finally, commerce. The

whole scheme was reminiscent of Berry's eco-cultural model (Berry, 1976; for details see Jahoda, 1995a). The mental equipment of all humans in all ages was viewed as being closely similar, savages suffering merely from relative ignorance rather than stupidity. Some even considered that this ignorance was often exaggerated, arguing in a manner reminiscent of our 'everyday cognition':

> Travellers have exaggerated the mental varieties far beyond truth, who have denied good qualities to the inhabitants of other countries, because their modes of life, manners, and customs have been excessively different from their own. For they have never considered, that when the Tartar tames his horse, and the Indian erects his wig-wam, he exhibits the same ingenuity which an European general does in manoeuvring his army, or Inigo Jones in building a palace. (John Hunter, 1728–93, cited in Slotkin, 1965, p. 212)

Philosophers of the Enlightenment were well aware of what Tomasello et al. (1993, p. 495) called the 'ratchet effect', as indicated by the following passage from Turgot ([1750] 1973, p. 41):

> The arbitrary signs of speech and writing, by providing men with the means of securing the possession of their ideas and communicating them to others, have made all of the individual stores of knowledge a common treasure-house which one generation transmits to another, an inheritance which is always being enlarged by the discoveries of each age.

As far as individual development is concerned, the assumption was that of a Lockean *tabula rasa*, expressed in a rather extreme form by Claude-Adrien Helvétius (1715–71). He went so far as to deny the existence of any innate differences, holding that the mind could be completely shaped by what he called 'education'. For him this included not merely teachers, but family, friends, mistresses and so on, as well as chance factors; thus he understood by this term more or less what we would call the sociocultural environment. This approximates the position later adopted by J. B. Watson, though Helvétius did not propose any mechanism whereby the influences were exerted.

Most of these ideas remained purely speculative, though later the need for empirical investigations was appreciated. When the *Société des Observateurs de l'Homme* was founded in 1799, its aims included plans for detailed observations of children's development from the cradle onwards, in evident ignorance that this had already been pioneered by Tiedemann (1787). Another more ambitious project was also mooted, and described as 'an experiment on natural man'. It was proposed to isolate from birth onwards four or six children, half of each sex, so that they would not be in contact with any social institution. These children would be carefully observed for a period of twelve or fifteen years in order to study the development of ideas and of language as governed purely by 'natural instinct' (Jauffret, [1801] 1978).

One study was carried out, namely that of Victor, the well-known 'wild boy' of Aveyron. He was regarded as having been in a pure state of nature when found,

and thereby providing an opportunity for a kind of natural experiment. Itard ([1801] 1932) believed that tracking the trajectory of Victor to normal maturity would be a means of throwing light on the general process of becoming civilized or, as we would put it, the acquisition of culture. Unfortunately, as shown by Pinel (a well-known alienist of the time), Victor was profoundly handicapped and made only slight progress.

Even this slight sketch should indicate that the Enlightenment in some important respects adumbrated today's ideas. By the time Napoleon's armies marched over Europe, reaction had already set in, intending to restore after the turmoil of revolution a supposedly traditional order. This included a change in attitudes towards the 'savages', increasingly regarded as irredeemable. Paradoxically, it was the new science that lent its authority to such negative views.

Biology, race and development

The eighteenth century had seen the emergence of biology in its modern sense, pioneered by Linnaeus. Towards the latter part of that century the rise of the anti-slavery movement produced a backlash in which the defenders of slavery postulated the innate inferiority of non-European races, comparing them to apes. Subsequently Cuvier began to transform biology from an essentially taxonomic enterprise into a functional one. The concept of the organization of the nervous system became the key for understanding biological processes in humans as well as animals. Cuvier devised an index of 'animality' depending on the relative size of the facial area. According to this, 'savages' were closer to animals than Europeans. Thereby the path was open to the race-thinking that dominated the nineteenth century, and what had previously been mere opinions about the inferiority of the 'Others' gained the stamp of scientific support. Human differences came to be largely attributed to biological causes, and those like Theodor Waitz (1863) who opposed this trend, adducing culture-historical factors, remained in a minority.

Throughout the nineteenth century differences between 'savages' and civilized peoples, as well as individual differences, were mainly attributed to biological endowment, and strenuous efforts were made to find evidence for this in brain structures. The lengths to which some savants were prepared to go may be illustrated by the bizarre case of the *Société d'autopsie mutuelle*, founded in Paris in 1876 by a group of physical anthropologists. They believed that the link between features of the brain and psychological characteristics had hitherto not been demonstrated for a simple reason: namely, that insufficient information had been available about the people whose bodies had been taken from hospitals and whose brains had been dissected. Hence all members were required to provide an autobiography, from childhood onwards, and later an extensive questionnaire was devised. The agreement was that the surviving members

would dissect the brains of the dead ones, and it was hoped that, armed with the requisite detailed knowledge, the relationship of brain structure to personal features could then be firmly established. Alas, they hoped in vain (Dias, 1991).

Going back to the issue of civilized versus 'primitive' societies, the backwardness of the latter came to be explained in terms of differences in child development. During the first half of the nineteenth century reports multiplied that children of 'primitive' races were at least equal in brightness to European children, and were sometimes even believed to surpass them. James Hunt (1865, p. 27), a notorious race propagandist, put it as follows:

> With the Negro, as with some other races of man, it has been found that children are precocious; but that no advance in education can be made after they arrive at the age of maturity; they still continue, mentally, children . . .

This alleged phenomenon was labelled 'arrested development', and efforts were made to find a biological explanation for it. The solution arrived at was a supposed early closure of the sutures, i.e. the junctions of the skull bones. One ingenious writer went further and put forward a quaint reason why this should be so: Europeans think more, and the throbbing of the brain produced thereby slows down the process of closure!

The empirically minded Francis Galton was exceptional in seeking some concrete evidence. A questionnaire prepared by him for travellers, missionaries and administrators (reproduced in Pearson, 1924, pp. 352–3) contains the following item:

> Children of many races are fully as quick, and even more precocious than European children, but they mostly cease to make progress after the season of manhood. Their moral character changes for the worse at the same time. State if this has been observed in the present instance.

Unfortunately, no answers have been preserved. 'Arrested development' later became somewhat confounded with a more famous theory, the so-called 'biogenetic law', which was applied increasingly to the interpretation of cultural phenomena. In its original version the law referred to embryological development, stating that characteristics held in common by large animal groups usually develop earlier in the embryo than unique features. As such, it was adopted by Darwin and still stands. However, it came to be extrapolated to *postnatal* development and later became known in psychology as the *recapitulation* theory. It was postulated that the cultural stages of the progress of humanity were functionally related to the biologically fixed phases of the psychological maturation of individuals. These phases recapitulate, in miniature as it were, the mental capacities corresponding to the hierarchy of cultural stages; and the progress of individuals in the lower races is arrested when they reach their biological limit. With recapitulation, as with 'arrested development', the question arose

as to what caused the cessation of development. The most common answer was that young people of the lower races abandon themselves to unrestrained sex immediately after puberty. It is often not clear whether this was thought of as a biological disposition, or socially determined.

These biological theories coloured nineteenth and early twentieth century ideas about savages and their children. In particular, the equation of adult savages with European children led to absurdities when it came to savage children. It was generally thought that savages do not train their children and let them run wild. In a typical passage Schultze (1900) commented that there cannot be a question of education among *Naturvölker*, since they have little if anything to transmit. Most of the writings were entirely speculative. William Preyer, a pioneer of child psychology, was exceptional in suggesting that explorers should carry out comparisons of small children among uncivilized nations with child behaviour in Germany (Preyer, 1882). The interest was focused less on what 'savage' children are like, and more on the relationship between European children and adult savages. Such comparisons, including even animals, were central to George Romanes' (1880) *Mental evolution in man* as will be documented in more detail later. Letourneau (1881) recommended the study of the dreams of European children as a means of gaining insight into the mentality of savages. The earliest textbooks of child psychology reflected the notion of 'childlikeness'; thus Sully (1895) drew parallels in his classical text between dolls and 'fetishes', or the language of children and that of savages.

From biology to culture

At the turn of the twentieth century the importance of child development for understanding adult society was not yet widely appreciated. Wundt's *Völkerpsychologie* (folk psychology) was intended to throw light on '. . . those processes, which, owing to their conditions of origin and development, are tied to mental collectivities' (Wundt, 1908, p. 226). This corresponds roughly to what is now meant by 'culture', and in fact in one of his last writings Wundt (1920) conceded that *Völkerpsychologie* and *Kulturpsychologie* (culture psychology) were equivalent concepts. Yet Wundt (1907, p. 336), maintained that '. . . it is an error to hold . . . that the mental life of adults can never be fully understood except through the analysis of the child's mind. The exact opposite is the case.' Later (1917, p. 195) he referred to the 'exaggeration of the value of child psychology'. It would seem that Wundt, like most of his predecessors over the centuries, regarded child development as something obvious and unproblematic.

It was a misjudgement, made at a time when the new field was emerging. Preyer in Germany, Binet in France and Stanley Hall in America were among those promoting it. Freud, an adherent of the 'biogenetic law', which led him to

compare neurotics with children and savages, proclaimed the first five years of life as crucial for later development. Stanley Hall sought to provide evidence of 'recapitulation', mainly by questionnaire methods. He also carried out a cross-national study, replicating an earlier German one of children's knowledge of concepts at the beginning of schooling (Schwabe and Bartolomai, 1870). Others subsequently produced a flood of questionnaire studies of children's moral ideas, one of which is of special interest: Hoyland (1926) carried out a study in India indicating that Indian children were less materialistic and more ethical and religious in their outlook than Western ones.

One of Hall's students, Appleton ([1910] 1976) attempted an empirical test of what she called the 'culture-epoch' theory, based on recapitulation, by comparing the games and play of adults in 'the lowest of savage tribes' with those of American children. It was a valiant effort, but although Appleton claimed that the outcome broadly supported the theory, in hindsight the study suffered from some fatal flaws.

By the first decade of the twentieth century the concept of 'culture' had already come to be more widely used. Its original definition, put forward by Edward Tylor (1871), had listed knowledge, belief, arts, morals and so on 'acquired by man as a member of society'. This notion of culture as something *acquired* or learned was to set the tone for about another century. Tylor never used the term 'culture' in the plural, and it was Franz Boas who began to do so at the end of the nineteenth century. In opposition to the doctrine that race governed the fate of peoples, he argued that culture and history were the essential determinants. He even sought to show that the cephalic index, one of the chief measures of racial identity long used by physical anthropologists, underwent changes in successive generations of immigrants (cf. Stocking, 1982).

While Boas' contribution is well known, that of a German armchair theorist writing at about the same time is not. After a comprehensive survey of ethnographic reports about the development of Negro children, Erich Franke concluded that while race may have some part, the primary factor was the cultural context that influences and constrains the course of their development (cf. Jahoda, 1995b).

Another theorist of that period was James Mark Baldwin, whose *Mental development in the child and the race* (1895), and subsequent works, were based on his own version of recapitulationism. He tried to demonstrate how the history of humankind (which is what he meant by 'the race') is reflected in the growth of the child. But, as has been noted, he was unconcerned with the development of the child within the family context.

While Baldwin was at Johns Hopkins, John Watson had also been recruited to the department there. They were very different characters and the main thing they had in common, it may be noted parenthetically, was that both

were expelled from the university: Baldwin for being found in a black brothel and Watson for an extramarital affair. Unlike Baldwin, who had been largely forgotten until Piaget resurrected him, Watson imposed his stamp on a new era of behaviourism. Apparently influenced by Freud, he carried out studies of the emotional conditioning of infants, immortalizing 'Little Albert'. His commonly cited boast of being able to make anyone into anything, irrespective of background and race, concealed his uncertainty about the effects of race. In his autobiography he imagined an 'infant farm' where sets of thirty pure-blooded Negroes, Anglo-Saxons and Chinese would be reared under identical conditions in order to resolve the issue. What is not in doubt is his belief that humans could be extensively moulded into any desired shape.

Watson's extreme environmentalism was in sharp contrast with the biologically oriented 'instinct' theories, inspired by Darwinism, which had led to speculative lists of literally hundreds of supposed instincts. Environmentalism was, however, in harmony with Boas' emphasis on human variability as a function of culture. This was the atmosphere which two prominent students of Boas, Ruth Benedict and Margaret Mead, imbibed. Mead had studied psychology as well as anthropology, and went into the field with test materials. Her position at that time – the 1930s – is clearly set out in the following passage:

> . . . many, if not all, of the personality traits which we have called masculine or feminine are as lightly linked to sex as are the clothing, the manners, and the form of head-dress that a society at a given time assigns to either sex . . . the differences between individuals within a culture are almost entirely to be laid to differences in conditioning, especially during early childhood, and the form of this conditioning is culturally determined. (Mead, [1935] 1950, pp. 190–1)

In other words, rather like Helvétius before her, she viewed human nature as more or less infinitely malleable by culture.

In 1930 Freud published his *Civilization and its discontents*, in which the term 'civilization' was more or less equivalent to 'culture-in-general', in the sense of Edward Tylor's original formulation of the concept. Freud postulated an opposition between biology and culture, whereby the latter rested upon the sublimation or suppression of biological urges. As far as development is concerned, the Oedipus complex was viewed by him as being of phylogenetic origin, and thus had to be overcome before an individual could function as a normal member of a culture.

Accordingly, it is not surprising that the most prominent psychoanalytic anthropologist of the period, Geza Roheim, defined culture in a manner that sees it as derivative from biology:

> By culture we shall understand the sum of all sublimations, all substitutes, or reaction formations, in short, everything in society that inhibits impulses or permits their distorted satisfaction. (Roheim, 1934, p. 216)

Although as an anthropologist he did discuss cultural differences, he tended to play them down by saying that they are usually exaggerated – a point not without some justification (Roheim, 1950). At any rate, his main stress was on biological universals: all culture, he maintained, is a function of prolonged infancy and the vicissitudes of the libido. Roheim dispensed what he himself called the 'undiluted Freudian wine' (Roheim, 1947, p. 29), viewing development entirely in these terms.

The reason for his strong defence of orthodoxy was that by that time neo-Freudians, notably Kardiner and his group, had considerably watered down the biological aspects and focused on modes of child rearing, themselves viewed as a function of modes of subsistence. But this was done at the cost of pathologizing culture, as exemplified in the following passage: 'The basic personality in Alor is anxious, suspicious, mistrustful, lacking in confidence, with no interest in the outer world' (Kardiner, 1945, p. 170). It should be added that contemporary anthropologists of a Freudian bent usually avoid such pitfalls and often make highly insightful contributions (e.g. Obeyesekere, 1990).

In the Soviet Union Vygotsky, while interested in psychoanalysis, was also critical of it; and it did not enter significantly into his own sociohistorical theory of development, which owed much to Darwinian evolutionism and, to a lesser extent, to Lévy-Bruhl (apart, of course, from numerous other influences analysed by van der Veer and Valsiner, 1991). Put very crudely, one might say that for Vygotsky the young child is a pre-cultural biological organism, which becomes transformed by a series of cultural devices such as language, tools and artefacts into a cultural being and thereby acquires the higher mental processes. At the same time there is of course no clear dividing line between 'natural' and 'cultural':

> The growth of the normal child into civilization usually involves a fusion with the processes of organic maturation. Both planes of development – the natural and the cultural – coincide and mingle with one another. The two lines of change interpenetrate one another and essentially form a single line of sociobiological formation of the child's personality. (Vygotsky, cited in Wertsch, 1985, p. 41)

It is also worth noting that Vygotsky did not regard 'primitives' as *biologically* inferior, though agreeing with the then widespread view that they were more restricted to the lower psychological processes. This was because they had not yet been exposed to the historical changes that gradually enabled Europeans to function at a higher level (van der Veer and Valsiner, 1991, p. 212). The Vygotskian approach has been highly influential, but the followers have not been concerned with the biological aspects and have explicitly disclaimed any interest in 'central processes'. This position has been slightly modified by one of the foremost American exponents of sociohistorical theory, who in a recent book (Cole, 1996) has admitted a weak version of modularity – more about this later.

Unlike Vygotsky, who had a literary background, the other great figure in child psychology, namely Piaget, was a biologist. But Piaget was also influenced by Lévy-Bruhl, adopting the notions of a pre-logical mentality and of 'mystic participation'. This became manifest first in his *Language and thought of the child*, where he bracketed together 'defective persons, primitive races and young children'. Such an equation of 'primitives' and European children, which Lévy-Bruhl himself had explicitly denied, harks back to nineteenth-century conventional wisdom. Piaget expounded his position at length in an early paper (Piaget, 1928, 1995). Only a few major features can be singled out.

Piaget referred to the 'astonishing functional similarities between the beliefs of primitives and children's ideas' (1928, p. 193), and went on to list a series of parallels which indicate his acceptance of hoary stereotypes; they include affirmation without proof, absence of logical coherence, 'participation', mystical causality, confusion of sign and the thing signified, and so on. He then went on to ask what could account for these similarities. The answer suggested by Piaget was that, paradoxically, social constraints and egocentrism operate in basically similar ways to produce the same effects. In both cases one has to deal with a mind lacking in education and not effectively socialized, being open to influence by the mere fact of age or power rather than intrinsic truth. Piaget's image of primitive culture is graphically conveyed in the following passage:

> In a society where the generations weigh heavily upon one another, none of the conditions required for the elimination of childish mentality can come to light. There is neither discussion nor exchanges of points of view. There is a totality of individuals whose autistic vision will remain ever uncommunicated, and whose communion is assured by the wholly external link of tradition. In such a situation nothing is invented by individuals, and nothing rises above the level of infantile thought. (1928, p. 201)

What is interesting here is that although Piaget was operating with a notion of 'primitive culture' derived from the era of crude biologism, his analysis stressed social factors, notably social interaction, as instrumental in development. Lévy-Bruhl himself retracted much of his original thesis toward the end of his life. But Piaget (1966), in an article where he acknowledged the need for cross-cultural tests of his theory, commented that the recantation had been excessive. Thus although he attempted a cultural explanation of the allegedly inferior cognitive functioning of 'primitives', he continued to hold stereotypical views derived from nineteenth-century biological determinism.

Until well after the Second World War Vygotsky and Piaget were outside the mainstream of psychology, whose centre of gravity had shifted to the USA and was dominated by behaviourism and the environmentalism that corresponded to it. This also largely applied to anthropology and is evident from the definitions of culture in Kroeber and Kluckhohn's (1952) famous monograph. It is usually cited only for its 159 definitions, but contains valuable discussions and analyses.

One can learn from it that only seven of these definitions contained any mention of biology, none of which made any direct link between culture and biology. On the contrary, some of the older definitions referred to culture as a 'superorganic' entity. Explicitly or implicitly, culture was treated as something acquired by individuals during the process of socialization by teaching and learning. This was and remained the dominant stance, and is still reflected by current authors, for instance in the recent edition of the *Handbook of cross-cultural psychology* (Camilleri and Malewska-Peyre, 1997). It is only fairly recently that radical questioning began (for an overview see, e.g. Brightman, 1995).

Before going on to this it is worth considering briefly the ideas of Skinner, the last of the behaviourist luminaries, whose first pronouncements on culture appeared shortly after the publication of the Kroeber and Kluckhohn monograph. He wrote: '. . . the culture into which an individual is born is composed of all the variables affecting him which are arranged by other people' (Skinner, 1953, p. 419). Culture was for him essentially a matter of *control*, a term that recurs in the discussion. But interestingly, he also made biological comparisons:

> The evolution of cultures appears to follow the pattern of the evolution of species. The many different forms of culture, which arise, correspond to the 'mutations' of genetic theory. Some forms prove to be effective under prevailing circumstances and others not, and the perpetuation of the culture is determined accordingly. (p. 434)

He returned to this theme some two decades later in a book that also touched upon child development (Skinner, 1972). Predictably, this consisted for him of the acquisition of a repertoire of behaviour under the contingencies of reinforcement set up by people in the social environment. It would seem that he hardly distinguished between culture and development, since he later (Skinner, 1987, p. 74) defined culture simply as 'the contingencies of social reinforcement maintained by a group'.

Skinner's references to the biological nature of humans are minimal, though he was of course bound to acknowledge the existence of an innate capacity to be reinforced. On the other hand he did elaborate, again in some detail, the parallels between biological and cultural evolution. A culture, according to him, is selected for adaptation to the environment, though he recognized that not all cultural practices are adaptive. But the parallel breaks down when it comes to transmission, since cultural evolution is Lamarckian. This is an aspect of Skinner's thinking that is seldom remembered at a time when similar ideas have come very much to the fore.

Fading of the boundaries

During the heyday of behaviourism the distinction between biology and culture seemed clear-cut, but thereafter this slowly began to change. From the

1960s onwards, behaviourism gradually gave way to the 'cognitive revolution'. The cognitive approach, with its connectionist models taken to characterize the human mind everywhere, constituted a decisive shift away from environmentalism and a concentration on putative central processes. As such it had initially little interest in culture and there were, and still are, those who saw cognitive science as a purely biological approach. Thus Jackendoff (1987, xi) wrote: 'the mind can be thought of as a biological information-processing device'. When it came to issues of development, such a stance was less easy to maintain since the question of how individuals become socialized into a given culture obtrudes itself. Hence there were attempts of various kinds to find answers. A recent example is that of Frawley (1997), who sought to reconcile Vygotsky's culture-historical theory with cognitivism. At the same time, the ancient notion that humans are almost infinitely malleable was decisively abandoned.

Chomsky had long adopted a nativist stance on language, and Fodor (1983) published his highly influential book on 'modularity', that inspired a plethora of research. Much of it addresses the issue of what aspects of cognitive functioning are predetermined by our neural architecture as distinct from those that result from experience. Until recently this would have been expressed in terms of whether not a particular function was innate. But the concept of 'innateness' itself has been subjected to critical scrutiny (Elman et al., 1996), and shown to be much more difficult and complex than had hitherto been realized.

The discussion regarding the number and kinds of modules is somewhat reminiscent of the 'instinct' debate in the early twentieth century. It is worth noting in this connection that the idea of cognition being of two distinct kinds is not a new one. Immanuel Kant, in his *Critique of pure reason* (1781), maintained that the categories of space, time, quantity and relations are not learned from experience, but constitute an intuitive apparatus for making sense of experience and the world. He attributed the cognition of these categories to a soul or self beyond experience. But Jakob Fries (1773–1843), a follower of his, rejected Kant's transcendental principle and suggested that human modes of perception and thinking are a function of our organic constitution, which, as it were, predetermines the categories available to us. Seventy years later William James (1890), in the final chapter of his *Principles of psychology*, came even closer to a concept of modularity since his approach was essentially Darwinian. He argued that there are two quite different kinds of cognition. One consists of the accumulation of facts we learn by experience during our lifetime; the other, which he called 'necessary truths', is the product of evolution.

This brings us to the rise of current evolutionary psychology, which has been comprehensively surveyed by Keller (1997). Hence only a few complementary comments pertinent to the present theme need to be offered.

As far as development is concerned, there is again a historical precedent. George Romanes (1880) was a follower and protégé of Darwin's who treated

human psychology as a purely biological product created by evolutionary processes. As far as cognitive development in childhood was concerned, this led him to a bizarre comparative scale: at birth a baby's mental capacity is that of a jellyfish, at three weeks of worms, at fourteen weeks of spiders and crabs, at five months horses, pigs, or cats, and so on. All this was based on the so-called 'biogenetic law', later adopted in psychology under the heading 'recapitulationism' (Haeckel, 1866).

Modern evolutionary psychologists, while necessarily giving priority to biology, all recognize the need to come to grips with culture, though they do so in rather different ways. Tooby and Cosmides (1992) treat culture as a subordinate category, whereby external circumstances trigger domain-specific biological mechanisms, and it is such mechanisms that determine the spread of cultural representations in populations.

They state quite explicitly that 'Human minds, human behaviour, human artefacts, and human culture are all biological phenomena' (pp. 20–1). A rather different approach originated with the biologist Richard Dawkins (1976), who suggested a parallel between genes and units of culture – which he left ill-defined – as 'memes'. According to him memes are subject to the same replication and selection processes as genes, the difference being that memes are much more recent. Hence this new replicator 'is still drifting about in its primeval soup' (p. 192), that soup being culture at an early stage of evolution. This idea was recently taken even further by Blackmore (1999), who regards memes as actively competing for space in human brains and seeking to propagate themselves. The study of such phenomena, which embrace all spheres of human activity, would become the science of 'memetics', a kind of quasi-biology. These are rather extreme positions, not shared by all evolutionary psychologists, some of whom view culture as a so far largely unsolved problem.

Plotkin (1997) describes it as 'one of the last great frontiers of science'. While all these writers are concerned with the relationship between biology and culture, few are particularly concerned with development. This is perhaps rather surprising, since the notion of modularity constitutes a crucial bridge between biology and culture.

Concluding comments

As stated at the outset, the brief sketch offered here is necessarily selective and greatly simplified. None the less, it should be sufficient to indicate that some of the issues that occupy us today are by no means entirely new. The influence of culture, as expressed by the term 'custom', has long been recognized, while the importance of innate biological factors came to the fore during the nineteenth century, predominantly focused on 'race'. On the other hand 'development'

was, until the latter part of the nineteenth century, regarded as unproblematic and only gradually attained increasing salience thereafter.

One can also discern a certain periodic oscillation in the relative weight attached to culture and biology. The Enlightenment stressed environmental factors, followed by a shift to biology, which lasted until the first decades of the twentieth century. This gave way in the social sciences to a radical environmentalism that is by no means dead as yet. There is little doubt that these broad movements of thought have been influenced by prevailing ideologies in society at large. It is clear, for instance, that nineteenth-century biological racism was linked to colonialism and imperialism. But as one comes closer to the present the links become less easy to discern for want of the necessary perspective, and their detailed study remains a task for the future.

At any rate, after the prevailing environmentalism of most of the twentieth century there has been a return to biology, not only in psychology but also in anthropology (cf. Sperber, 1996). However, in contrast to the previous century, connectionism is universalistic in orientation and as such initially concerned primarily with the effects of neural architecture, to the exclusion of culture. It is only rather recently, under the influence of neo-Darwinism, that a further change has taken place with a quest to integrate culture and its variations into an evolutionary scheme.

As a result, the former sharp distinction between biology and culture is giving way to the recognition of their interrelationship, though its exact nature as well as its significance for development remains as yet controversial; and so does the question as to the extent to which aspects of development are pre-programmed. So far cross-cultural and cultural psychology have only been marginally affected by the new thinking. If they continue largely to ignore it, they risk being left behind.

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